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EDITORIAL

By the time this issue reaches the reader, momentous events may have taken place over in Europe. A midsummer burst of wishful thinking, born of the "purges" and such in Germany and allied battle successes, prompts the notion that Hitler and his hordes may have caved in by this time, or may be definitely in the process of so doing.

Further wishful thinking fosters the idea that it would be a grand thing when the European war is ended to discharge immediately and send home all the men who just now are engaged in the laudable business of knocking out the enemy—with enough men also released or relieved of vital war work to put together some of the equipment needed to replace machinery that has taken an awful beating in non-essential industries during the past four or five years.

However, while thinking wistfully of what we have not, let's be thankful for what we have; glad that it isn't worse, as it might well be. And by the time Christmas rolls around we hope we shall have cause to observe the day with fervor.

The order of the day is "Look Forward". Look Forward, with the certainty that we will make plans, individually and as groups, in order that we may not be held guilty of contributing, by inaction, to unemployment and disorganized conditions. That's the real heart of the post-war problem, with personal benefits running a close second, to be sure, but not anywhere nearly as important as the condition of prosperity or sorrow, grief and misery that will prevail throughout the nation.

In various parts of the nation, astute business men are preaching of looking forward to what's needed and wanted after the war. Discounting dreams about houses and automobiles and airplanes and some other things that might not find a ready sale—even if they could be produced—there is a huge backlog of demand and desire for almost everything.

Constructive post-war planning fostered by business men, each in his own community would, in the aggregate, assure a peace time future — immediate or eventual — of progress, hope and prosperity.

M.H.B.

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Any member who can spare any of the issues listed is urged to mail same immediately to the Secretary.

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ALL MEMBERS WHO, AT THE PRESENT TIME, HAVE LIBRARY BOOKS ON LOAN, AND WHICH HAVE BEEN OUT OVER THE USUAL 30-DAY PERIOD, ARE ASKED TO RETURN SAME TO THE OFFICE AS SOON AS POSSIBLE.

W. H. FURNEAUX, R.I.A.
Aerovox Canada Limited

Newly Elected 1st Vice-President

The Canadian Society of Cost Accountants & Industrial Engineers

Night Fall: Luxor

A poem by PROFESSOR R. R. THOMPSON, one of the Founders and an Honorary Member of our Society.

I

Night fell on old Luxor;
Then o'er the desert, darkness swiftly crept,
And filled the distant valleys, where there slept
The spirits of a hundred Theban kings,
Whilst, save the rustle of the night-wind's wings
Through those vast temple halls and colonnades,
As if the ancient gods held court with shades,
No sound broke o'er the scene.

II

All nature, hushed in awe
Before the splendour of the dying day,
Lay silent, and below swept on its way
The Nile. E'en as I watched, the light had flown
The zenith's boundless spaces: then were sown
With countless stars the sapphire depths of night,
Whilst oceans of transparent amber light
Flowed down the western sky.

III

Above the Libyan hills
Some clouds hung flaming 'midst a blood-red glow;
Then fell on all the silent plain below,
A silence more intense. Infinite space!
Infinite worlds of light! I hid my face,
And bowed my head, o'erwhelmed with such a flood
Of thoughts, too vast for finite minds: I could
But wonder, what is man?

IV

I leaned my arm against
A column of stupendous size, beside
Whose bulk a mote I seemed. In all their pride
The massive ruins seemed to say to me,
"Ye pass; but we, in our immensity,
"Live on eternal as the hills which gave
"Us birth, and as the Nile whose waters lave
Our base, immutable."

V

It seemed that men were naught
But tiny insects, crawling, till they died
And crumbled into dust. Just then I spied
A star supremely bright, and swiftly sped
My thoughts o'er countless million miles of dread,
World-peopled Space to ask, if, there, are men
With minds like ours, who build great temples; then
Stand wondering at themselves.

VI

By thought I flew through Space,
And trod the outer spheres. I saw that man
Could n'er be measured by the cubit's span,
Nor weighed like stone; for he is god-like, vast,
Whose will-power raised these temples of the past,
Who understands the movements of the throng
Of Heaven, and measures Space; this flame of strong,
Undying energy.

VII

I looked around again
At those stupendous ruins of Luxor,
And spake my answer back: "Ye were no more
"Than shapeless stone till man created ye
"In his imagining, and painfully
"Subjected nature's powers to his will
"Till ye from out o' the bowels of your hill
"Were carved, and made yourselves."

VIII

"We pass, but ye stay here
"Unmoving, senseless, dead, in slow decay.
"Ye truly spake: we pass, but on our way
"To solemn portals, some call Death, where all
"That chains us to this Earth aside shall fall,
"And we shall stand, and know as we are known,
"Be free to wander, where our thoughts had flown,
"Creation's furthest realms."

IX

"E'en now, with flesh-veiled sight,
"We thrill responsive to our Father's Mind
"Who wrought the sunset's glow, and we shall find
"Undreamed-of glories, when we grow as He
"Would have us grow, in endless harmony—"
Thoughts came too fast for words; but I had said
Enough, and, through the darkness with my head
Erect, passed on my way.

A. G. HOWEY, R.I.A.
Mercury Mills Limited

Newly Elected 1st Vice-President

The Society of Industrial & Cost Accountants of Ontario

Wage Systems

By ERIC AUSTIN TRIGG

PART II

Taylor "Differential Piece Rate" System

This system, developed by Frederick W. Taylor some years before the plan of Halsey, rather than being based on time wages, is a modification of the piece rate system. The plan is one by which two rates are set. These two rates consist of one well above the normal time rate, and one somewhat below. Then, the workers who receive the higher rate are those who can reach and surpass a specific standard of performance. This standard of performance is set on a much higher level than what was considered to be normal under the Halsey system. It is set at a level attainable by proficient workers, working under the best conditions.

This whole system can be seen to rest upon the choice of the correct standard. The standard must be exactingly accurate since it determines the difference between high wages and low wages. Taylor realized the dangers of a piece work system, and in order that he might arrive at the proper rate, to secure increased earnings for workers and increased production for employers, he introduced a system of time studies.

Stop watches were used and every operation of the worker was broken down into elementary functions and timed. This was done with the best of equipment so as to insure a high standard of performance and a high degree of efficiency. This time study was one of the first real attempts at Job Analysis. These time studies showed the required standard, and set a level, above which the high rates prevail, and below which lower rates are paid.

The original idea of the system was to eliminate all of the poorer workers from the shop entirely. It was thought that the differential scheme would make it more worth while for the better qualified, competent, and efficient men to do their best, while at the same time it would discourage those who were not so well qualified. It was felt, that if they constantly found it impossible to maintain a high level of performance they would eventually drop out, and go into industries for which they were better fitted. High piece rates were considered desirable if each man and machine in the company was turning out a proportionately larger amount of work.

This idea has not been borne out entirely, however, as it is found that there is considerable incentive in the ranks of the lower rates to get up to the higher rate level by achieving the desired standard of performance. A curtailment of output, on the part of the worker, because of the lower wage rate, would only serve to reduce his total earnings.

The full value of this system cannot be appreciated until it has been tried. Success or failure of this system depends to a considerable extent upon the group of men to which it is to be applied. Some men would not mind starting with low rates, if high rates are possible at some future date, while others would not feel it worth taking the chance.

From surveys of plants using this system it has been found that the other systems get more response from the workers, but this system gives

more satisfaction to them. Exceptions to this were found in plants where rates were set on past experience rather than by precise time studies. Some rate revision has been found to be necessary though the amount has been negligible.

Merrick Modification

The Merrick Multiple Piece Rate is a modification of the Taylor system. In it there is a second differential, or a second goal at which the worker can aim. It gives the moderately efficient worker a level of accomplishment at which to aim. This system of differentials extended would seem a more logical way of setting wages.

Gantt Task and Bonus System

The system about to be discussed was devised by Henry L. Gantt, an associate of F. W. Taylor. The system was so constructed as to combine the characteristics of the Halsey and Taylor plans. The basis of compensation is time, as in the Halsey system, while the Taylor system contributed the idea of a set standard of performance, which, when attained by the worker, gives him a higher recompense. The idea of giving him a percentage of the profit from excess production is dropped. The worker receives not merely the equivalent of a full piece rate in the bonus for time saved above this standard, but something extra, too. Under the Halsey system he received only a portion of the time saved, but this system is dropped and the Taylor system of "something additional" is used. The rate is expressed in terms of the time wage, but is equivalent to a high piece rate.

The Gantt system may be summed up as a high piece rate system with a guaranteed minimum time wage, but centering at a point of "standard" productive efficiency considerably above the normal.

The task and bonus system was designated to give greater encouragement to beginners than the Taylor system offers. It assures them a definite wage and also provides guidance to assist them to a greater efficiency. The jobs were analyzed and broken down into their first components. The time necessary to the completion of each minor operation was shown on a card. This card, with other instructions as to the best methods of completing all the jobs, was then given to the worker. All of the time allowances totalled served to show the worker the standard time required for the task. It served as a standard of comparison for the worker, and told him whether or not he was keeping up to the standard rate of progress.

Gantt worked with the workers and always emphasized the necessity of training them to perform the standard task. All efforts were made to help the workers avoid making errors. Gantt realized the value of low labour turnover, and began a plan to train inefficient workers to reach the high standards required.

To start with, Gantt made the standard task one which was above the average. It was carefully calculated so as to require steady application on the part of the worker, and also, the use, by him, of the best possible methods by which the job could be efficiently performed. Everything was done to start the worker on the proper methods and he was encouraged to follow these at all times. There was some feeling, on the part of the workers, of not liking to be told how to perform their own special task, but this

opposition seldom reached important proportions, and once they earned the bonus there was full compliance with the instructions set out.

Standards were guaranteed against change unless manufacturing methods were altered. This helped to provide a sense of security in the minds of the workers, for the fear of rate-cutting was not always present as it was in some other methods. However, with this method, as with all others having guaranteed rates, there is still some suspicion in the minds of the workers and they, very often, limit their production just to be certain.

The provision was made, for the benefit of the worker, that if he found the task to be much too difficult, and could prove it to be so, he could adjust it to a more fair level. It was quite natural that some compromises along this line would have to be made.

The idea of a set task has proven more effective than just leaving it to the worker to turn out his maximum production. It gives the worker a definite goal, and it becomes much easier for him to turn in his best performance under these circumstances.

In conjunction with the individual bonus of the Gantt system, there is a further bonus, given to the foreman, which is tied up, in some specific way, with the production of the men under him. Very often the foreman's bonus is based on composite quality and quantity. This insures close inspection as well as incentive to production.

Advantages and Disadvantages

Most of the advantages of this system have already been pointed out in the earlier discussion. It combines the better features of both the Halsey and Taylor systems, while avoiding some of their difficulties. It is based on the time wage system, but avoids the partial bonus feature of the Halsey system. It contains the "prize" feature, the exceptionally high piece rate for performance above standard, while avoiding the discriminatory wage for work below standard. The high standard will lead to better performance on the part of the workers, and to a gradual replacement of the lower grade workers by those of a higher standard of efficiency.

The criticism most often put forward is that the plan makes no provision for workers who do not quite reach the high standard. The discouraging effect on the worker of not being able to reach the complete standard may be detrimental to the work he does. This, in some cases, has been taken care of similarly to the Merrick Multiple Piece Rate plan by setting another standard at about 90% or 95% of the first.

The "Task and Bonus" system resulted, in general, in a greater increase varied from 10% to 300% with the mid point at 32%. The rate of increase in earnings ran very close to that of the Taylor system, while the reduction in unit cost, in general, has been greater.

The establishment of a fairly large bonus is essential to the success of the system. It must be of sufficient size to give the required incentive. If it is not large enough the workers will not feel it to be worth their efforts to reach the high standard set. It is interesting to note, in this connection, that where the bonus offered is at its highest point the number of workers reaching the required standard, and thus earning the bonus, is also at its highest point.

The system is found to be applicable to nearly all jobs, and removes the difficulties of interrupted work because of the minimum time wage

which is always paid. When first introduced it was met by considerable suspicion on the part of the workers. Any incentive system must face this resentment at being "interfered with", but once the system is established and proven in the minds of the workers, this feeling is swiftly erased.

100 Per Cent Premium System

This system is similar to the Gantt system, being based upon the time wage expression, pay being offered for production above standard at the regular time wage "for the time allowed under standard specifications for the total number of pieces actually completed". The same idea may be expressed, taking the job as a fixed unit, as "a premium at the regular time wage for all time saved over the specified standard time". The plan simply amounts to a straight piece rate converted into time wage expressions for efficiencies above standard.

Careful timing of operations is necessary and processes must be thoroughly standardized. A definite amount of time is set for each separate operation, and all time saved over standard is paid for at the full hourly rate of the operator. The standards set are guaranteed, and no changes are made in these except where the actual methods of operation are changed. The hourly wage is guaranteed, so that the operator is guaranteed a minimum wage even if he fails to equal the standard.

This system avoids the abrupt jump from the regular time wage to the exceptional piece wage under the Gantt system. It serves, however, to give a somewhat smaller reward to the operative than does the high premium of the Gantt system. It is highly advantageous to the employer to have this system installed. The reaction to the 100% premium, on the part of the workers, is favourable indeed, although the worker may earn less under this system than under the Halsey or Rowan systems due to the high standard originally set which must be passed before the 100% Premium comes into effect. This system rewards only the exceptional workers, as it is usually set too high for the average worker.

The clerical work required for this system is negligible. All that is needed is the number of pieces which have passed strict inspection and the standard required pieces per hour. These, together with the operator's hourly rate, can determine the total earnings.

For workers who achieve the standard the unit labour cost becomes constant and this is of great help in costing.

This system has not been used to any great extent and it is difficult to really conclude whether or not it is better than some of the others already described.

Standard Hour System

The Standard Hour system is, in reality, a modification of the 100% Premium method. It pays a flat piece rate for all production above a specified standard of efficiency and a flat time rate for all of the production below this point. This standard of efficiency is not the "standard efficiency", but a point somewhere below, a percentage of the "standard efficiency". This percentage is generally around 70% to 80%. This undefined point to be set as a standard leaves considerable leeway for adjustment of the difficulty of performance to be reached in order to receive the bonus. It also permits the adjustment to be set at a percentage calculated to obtain the required incentive to effort.

The compensation is expressed in terms of time wages, but the rate applies to a standard hour of specified output. The worker's actual compensation is a percentage of the standard wage rate equal to the ratio of his actual output to the standard output. That is, down to the established bonus point, at which point he receives only the guaranteed minimum time wage.

The whole system is based on a thorough standardization of operations and setting of standards. The number of standard hours is arrived at by multiplying the number of good pieces in a lot by the unit standard for that operation. Now, if for a certain operation, the standard is twenty minutes and an operator turns out thirty good pieces, he is credited with ten hours' work at his standard rate. In addition to pay for standardized work at a standard rate, the worker is paid for his hours put in on unstandardized work at his guaranteed minimum rate.

Emerson Efficiency Bonus System

This is a plan which is fairly well known. It sets a standard of efficiency at a point below the "standard efficiency", and begins bonus payments at this point. The bonus, rather than being the equivalent of a flat piece rate, as in the "Standard Hour" plan, is in the form of a carefully graduated scale. This scale is, in effect, a time rate, rising slowly for the lower grades of performance and increasing until the grades become higher more rapidly. At 100% efficiency the rate becomes almost a straight piece rate, with a very slight decline, set at a high scale as under the Taylor and Gantt schemes. If, for example, the standard of efficiency is chosen as 67% the following table would be used.

Efficiency Per Cent	Bonus Per Cent
67	0.01
68	0.04
69	0.10
70	0.20
....	.....
....	.....
75	1.31
....	.....
80	3.30
....	.....
90	10.00
91	11.00
92	12.00
....	.....
....	.....
100	20.00

Just enough of this table is illustrated so that the general trend may be seen. As the efficiency percent increases the bonus percent shows a corresponding increase. The higher the efficiency percentage becomes, the greater become the increases in the bonus percentage.

It may be noticed that above the 90% mark the increases are in steps of 1%.

From the above it can be seen that wages up to 100% efficiency are equal to the time wage for the time taken plus the corresponding bonus percentage. Where efficiency is greater than 100% the total wage is equal to 100% of the time wage for the time taken, plus 100% of the time wage for the time saved, plus 20% of the time wage for the time taken.

This method, like most others, requires careful preparation. Manufacturing operations and conditions are standardized. Time studies are made, and the best, and quickest, methods of doing the jobs are determined. The 100% efficiency mark is set as one which can be repeatedly maintained by a skilful worker. The basis idea is to encourage the worker with small bonuses, until his efficiency grows and the bonuses grow with it. The basic wage is guaranteed and, therefore, there is no penalty for failure to attain standard performance.

This system is beneficial to workers who, though unable to reach the full standard efficiency, can come very close to it. It gives them the needed incentive to keep them working always to the best of their ability. The bonus is constantly increasing and, therefore, a worker can always see greater earnings ahead if he increases his production. This plan, unlike the Taylor and Gantt plans, is not apt to discourage the worker who cannot reach the full standard, but rather it shows him that his extra effort is being rewarded. The system is, perhaps, the most flexible of those discussed, and offers equal chance to all workers to add to their output and be rewarded just a little more for each increase in output they make.

In the actual setting of the 100% efficiency standard, the point at which the bonus payment start, the scale of early graduations of bonus, and the height of the additional bonus, the type of industry and the existing conditions must be given full consideration.

The Emerson system has resulted in production increases from 25% to 100%, earning increases from 10% to 100%, and unit cost reductions of 15% to 50%. It was found that 80% to 90% of the employees earned premiums, and yet there was little or no rate cutting.

The system seems easily applicable to most industries and there is little or no opposition on the part of the workers, excepting, of course, the "usual natural resistance to new methods". In most instances, the actual calculation of the wages is found to be beyond the grasp of the workers, but they do understand the principle behind it.

General Conclusion

Although there are many more incentive systems in use, for purposes of this paper the discussion has been limited to the above, in the belief that, on the whole, they cover most of the real systems and most of the others are merely modifications.

The aim of all incentive plans is an ultimate increase in production, a decrease of unit labour costs, and a better opportunity for workers to increase their earnings. Most bonus, or premium, systems differ from the piece wage system in that they are expressed in terms of time wages.

One of the major considerations in the installation of any system is its initial complexity. To be successful, the system should be of such a nature as to be easily understood by both workers and employers. It is true, however, that a worker will not worry too much about the complexities of a system if he sees that his pay has shown a considerable increase, after his

production has been increased, under the new plan. The success of any plan is also dependent upon the method by which it is put before the workers, for it is the initial acceptance, or partial acceptance, which will decide the fate of the plan.

Compensation Equalization Within the Plant

It is agreed that the chief advantage of bonus or premium systems lies in the fact that they are expressed in terms of time wages, which permits ready adjustment of wage rates to market conditions. It has also been claimed that these systems permit adjustment of compensation to the personal qualifications of individual employees. This, in view of my preceding discussion, I would prefer to qualify, saying that it is a Job Analysis and Evaluation, as applied by the various wage systems, which permits adjustment to personal qualifications of individual employees. The major difficulty arises, however, with regard to adjustment between different types of work within the same plant.

Major cause of discontent on the part of the workers seems to arise from alleged discrimination between different types of work. Operatives on one job find the task of earning a bonus much simpler than do those on another job.

Before Job Analysis and Evaluation became prominent, and in most cases where it is still unheard of, there were some methods proposed by which basic wage-rates might be put on an equal footing. These methods, though not as "All-covering" as the newer, better Job Analysis methods, approached the problem from a fairly sound point of view.

Bedaux Point System

This plan reduces all work to a common denominator and makes possible the establishment of differences in compensation that are easily recognized. If properly formulated, in the beginning, the risk of further discontent following a change in standards, could be removed.

The plan consists of an analysis and reduction of all industrial efforts into elementary motions. The rest periods necessitated by each type of strain are determined. These are calculated in conjunction with the muscular effort required, strain from rapidity of movements, the strain due to the sequence of certain movements, or merely the position of body or limbs.

From the careful studies made, three general laws were formulated:

1. "For a muscular effort of a given power, the ratio of strain is directed proportional to the rapidity of motion and completion of the cycle."

2. "Rapidity of motion is inversely proportional to weight handled, pressure applied and length of cycle."

3. "For a muscular effort of a given power, the duration of work and rest periods is inversely proportional to the rapidity of motion."

A wide range of the proportion of relaxation time to working time is necessary, due to the great differences in the requirements of the various types of effort.

All manufacturing operations are combinations of certain elementary motions, and since the exactions of each elementary motion is carefully determined it is argued that the work and relaxation proportion for each operation can be ascertained.

The next step is the determination of a unit of measurement to translate each operation into terms of requirements for every other operation.

The Bedaux Point system, as mentioned before, was an early attempt at Job Analysis. It used points per minute as a basis of comparing elementary operations. It was proven successful in many plants and must be looked upon as a stepping stone in Job Analysis.

Haynes-Manit System

This system is another point system. All work in it is reduced to "standard man-minutes".

A Manit is defined as representing four-fifths of the amount of work that a normal worker can turn out in a minute of time without over-exertion and irrespective of the nature of the task. Then, by time study, the standard number of Manits set for each task is determined. The worker's efficiency is measured by the number of Manits which he produces. This rating, regardless of differences in the nature of the work, is comparable to that of all other workers in a plant.

The Manit is a unit of effort, rather than a unit of work. It is a unit applicable to the work of an entire plant. The different types of tasks, within the plant, makes the establishment of a specific Manit standard, for each type of operation, essential. A comparison of Manit standards does not refer to the work done, which might require differences in grades of skill and might result in units that are quite diverse, but refers to the effort required to do the tasks set. If the Manit standards are set on an equitable basis they serve as a comparison of jobs for workers, not only in the same departments but in all of the different departments throughout the plant.

The actual working of the plan follows these lines. Assume that a worker produces 500 articles in a day or, in a ten-hour day, 5/6 of an article per minute. This is taken as a standard and any worker who produces 5/6 of an article per minute is credited with one Manit. Now, if a worker is paid at the rate of 80 cents per 100 Manits, the worker who makes 500 articles will be paid 5 x 80, or $4.00. If another worker produces 600 articles he is credited with 6 Manits and receives 6 x 80, or $4.80.

The common denominator makes possible the application of this plan to indirect labour, as well as direct labour. This adds incentive to their efforts, and results in better final production. The system can also be applied to supervision by "efficiency ratings".

If the jobs under consideration are too widely diversified it may be difficult to apply the common denominator, but it has been successfully used in such work as hand composition in a job printshop, and to the manufacture of ornamental chandeliers produced in quantities ranging from one to five of each particular design.

The Manit system has a high degree of flexibility in its application to various kinds of labour because its standards are established on a time basis, rather than a money basis.

Essentially, the Manit system embodies all of the simplicity of a piece rate system. Compensation is adjusted to the amount produced, but the method of computation is more flexible than an ordinary piece rate system. For example, when a man is hired at 60 cents an hour, the hour is under-

stood to mean 60 Manits of labour, not the passage of 60 minutes of time. Thus, in the regular day, the worker may do more or less work by hours of Manits than he would ordinarily be credited with on an hour of time basis. Setting of minimum wage rates is left to the discretion of the company and generally depends upon individual company policy. Differential rates, based upon length of service, proven ability, or other just reasons, are sometimes used with the Manit system.

General Conclusion

It can be seen very easily, that while these attempts at equalization of compensation within the plant are pointed in the right direction, they are, actually, merely stepping stones on the way to proper Job Analysis and Evaluation. As was pointed out, in the early discussion of Job Analysis and Evaluation, there were many attempts made, and there are many attempts still being made. We are still a considerable distance from a perfect method of Job Analysis and Evaluation, and may well be for some time to come.

In this discussion no detailed information about Group Incentive systems has been given, but a few words, in broad outline, should serve to illustrate the general principles. Where an individual, working alone or with a machine, turns out separate and distinct articles, the systems described may be applied, or in some form or other. In many cases, however, the final product is the result of joint effort, by a group of workmen, and it is impossible to measure the relative functions of the separate workers. Under circumstances such as these the joint product is treated as a unit, and the group of workers as an individual. Then, any bonus earned by the group is distributed on the basis of the relative wages of the members of the group. A group bonus plan may only be applied where there is a real need for co-operation in getting a job done. Such a bonus system, where applicable, may develop a greater willingness to work on the part of the men concerned and show itself in increased production and more efficient work. There is the difficulty, however, that good men may "carry" poor men in the same group. The further the group system is extended the more likelihood there is that some of the workers, or departments, may do most of the work while some others do only a little.

The Theory and Practice of Time and Motion Study

The Text of a Talk Given Before a Meeting of the Society of Industrial and Cost Accountants of British Columbia

By J. W. PARR

In giving this talk on the theory and practice of Time and Motion Study I shall speak very shortly on its origin and in more detail upon the standard procedure, its adaptation to a modern industry with which I am acquainted and its position in the post-war manufacturing world.

The credit for originating time study methods for determining Standard Times for operations, is usually given to a man named Taylor who was a foreman in a machine shop and thoroughly conversant with all the problems inherent in piece-work wage-payment plans. A good machinist or foreman could take a blueprint of a machine made part, and would be able to make a reasonably accurate calculation on how long manufacturing a given number of these parts would tie-up the use of certain machines. However, such skilled knowledge would seldom be available for this type of work. Time study has made it possible for a clerk, with practically no active knowledge of machinery and its uses, to load machines with a great degree of accuracy, arrive at delivery schedules and to set piece-work and standard rates for operations. A well known exponent of the "Motion" part of time and motion study was Chic Sale. No doubt you all know the story about Chic's woodshed—located on the path between the house and the little out-house on the back of the lot. Many extra loads of wood were brought in to the house by this example of applied motion saving psychology.

Thus time study observers not only set-up the basis on which the standard times are computed, but also suggest improvements in methods and operational sequences wherever they can notice wasted effort and motions.

The large industry of to-day is an outgrowth of the small shop of yesterday. The small shop was usually started by a skilled workman possessing more than the usual qualities of leadership and initiative. As the shop grew, more supervision and control became necessary than could be exercised by one man, thus foremen were hired to supervise groups of men. Still while the shop was comparatively small the foreman's duties were widely diversified; he hired and fired men, instructed new employees, loaded the machines both as to quantity and variety of work, ordered up material and looked after its storage, scheduled deliveries, etc. In such time as he had free from these diverse duties he supervised his workmen. As industry grew it became impossible for a foreman to perform adequately all these duties, so that service or staff departments were established to serve him, such departments as: engineering, inspection, time study, purchasing, stores, production planning, industrial relations, etc. In this manner Time Study departments have been created in many manufacturing concerns, always as an aid primarily to the foreman, secondarily, although

almost equally as important, to other departments such as the cost, production and planning and scheduling.

The standard procedure followed is for a trained observer, with the aid of a stop-watch, to make a series of ten or more "studies" of a repetitive operation. An average time is struck, various allowances are made for personal fatigue, etc., and a standard time set-up by the use of a levelling factor, the method of establishing which varies with the school of thought that the time study manager follows. I shall only deal with the one that I have found most satisfactory in my work at Boeing Aircraft. From the time study various forms of instruction cards are prepared which should show exactly how each operation should be performed, the tools needed, machine set-up time, materials required and how long the operation should take; i.e., the standard time for the operation. These cards not only help the foreman to teach the employees the operations, but also serve as a check on their performance. Furthermore, they can be used by the production planning department in determining the time required for the manufacture of various parts, or, in the case of assembly plants, the personnel required to complete certain assembly operations on a given schedule and by the cost department to set-up standard labour costs or pre-sale estimates.

Thus the function of the Time Study Department is to improve the methods of doing the work performed in the plant and to provide the basis for controlling production and measuring its effectiveness. The department is usually responsible to the production manager or the executive responsible for factory service departments, although in many cases it is directly under the control of the general manager. In any event it must be free to criticize constructively or to advise unbiased by the influence of any one interested department such as the superintendent's office, cost or factory accounting department or the production planning group.

Most of my previous experience has been with the study of "machine" operations, studies in which the variance in the time element in the actual operation was very slight because of the man performing the operation was considerably governed by the speed and rate of feed, etc., of the machine. About a year ago I joined the staff of Boeing Aircraft of Canada Ltd. to organize a time study department to help speed up production and to decrease consumed man-hours on the major assembly lines of the PBY aircraft. Believe me, I have since run into problems in time study that I never realized existed before.

In aircraft assembly work there are practically no machine operations, almost all are structural ones, such as fitting and rivetting, which are governed entirely by the individual employee, resulting in very wide variances in times on repetitions of the same operations. Therefore, as a department, our first work before standard times could be set was analyse the causes of these wide variances and to determine the best means of establishing a levelling factor for the creation of the targets or standards. We made studies in many shops, suggested various methods of decreasing consumed man-hours by changing sequences, having notice boards placed in the view of workers with a goal for the week or month displayed, by suggesting changes in tools and jigs and their locations. Then taking all these things into consideration and by judging to the best of our ability

the skill and effort of the employee doing the job, we set, I am afraid in rather an arbitrary manner, in our own records a "standard time." Over a period of months we watched the progress of these shops in which we had made the studies towards accomplishing their operations within the times which we had set. We were most gratified to note that in every instance the consumed man-hours per unit showed a very decisive drop immediately after our presence in the shop and then levelled off in the neighborhood of the standard which we had set.

From this rough start we have been able to set up a form of procedure which I can best explain to you by reference to the forms that have been passed around to you. We will first deal with the rectangular shaped sheet. This primary operational study form is used by the observer making the actual study in the shop. Spaces have been allotted at the top for all relevant detail and on the left-hand side the major-assembly operation is broken down into the minor or sub-operations that are to be individually studied. The observer lists these sub-operations and numbers them in the sequence in which they are performed. If he believes that man-hours could be saved by altering the sequence he writes out the suggested change and his reasons on the back of the form. The same applies to any other labour saving suggestion he may wish to make while completing the time study.

As each sub-operation is started he finds out the clock numbers of the employees that do the work, allowing two lines for each worker, and in the first space in the top line (on the right-hand side of the rating column) notes the actual time the employee(s) starts on the operation. Each time the employee leaves the job the time is noted twice, once in the next space in the top line and again in the space below on the line termed "consistency", and reversely, when the worker comes back to the job the time is noted on the bottom line to denote the end of the absent period and again on the top to show that work on the operation is again in actual progress. Termination of a working or absent period is always marked with an asterisk to facilitate charting the actual movements of the worker. The observer must always endeavour to obtain the reason for the employee's absence and mark it in code on the bottom line, e.g.—"A" absent for no specific reason, "B" work stopped to allow another person to work or "bottleneck", which, incidentally, will often result in the observer suggesting a change in the operational sequence, "C" leaving the job for conversational purposes, "D" delay due to Inspection or some other similar legitimate reason, "I" receiving or requesting instructions from supervision, "LA" legal absence such as smoke and lunch periods, "T" absent to sharpen tools or go to the tool crib, etc. From this information we can determine how much time is lost on legitimate delays and the illegitimate absences help us to rate the effort of the worker.

When the sub-operation is finished the total time in the top line will represent the actual utilized man-hours required by that employee, or, if it is several employees, that specific group of workers to complete the operation; while the bottom line will explain most of the difference between the actual and the charged man-hours through the time centre.

In the rating column, the observer puts in a code letter representing his opinion of the employee's SKILL denoted at the head of the column by

the letter "S", and EFFORT by the letter "E", but this rating applies only on that one specific operation at that time, as the rating for a worker varies according to the way he is feeling that particular day and with his aptitude and knowledge of each different operation. As I said before the effort rating is governed largely by the story told in the consistency line as well as by the observer's own decisions as to the actual effort put into the job. In rating skill I have endeavoured to train the observer to note whether the worker is a misfit, familiar or unfamiliar with the work, new or old on the job, sure or uncertain of the proper sequence of sub-sub-operations, makes few or many errors, whether his movements are smooth or clumsy and awkward, he co-ordinates mind and hands, has or lacks self-confidence, reads blueprints with ease or difficulty, able to think out small difficulties and problems for himself, etc.

The code for both skill and effort runs from A1 and A2 for super-skill and killing effort, down to F1 and F2 for bad skill and bad effort. Thus "D" becomes average or, preferably, "Standard", the ideal for the work to be done. For each one of these code letters we have determined a "levelling to standard" percentage ranging from plus 15% for A1 to minus 22% for F2, based upon our findings, as outlined before, and the standard levelling percentages laid down in the Time Study Course at the University of Southern California. It should be noted that just the same as the time that a bad worker takes to do an operation should be decreased to become standardized, so should the time of a man who works too fast for efficiency be increased.

For example, a man rated A1 for skill and A2 for effort does a certain operation in two hours, the standard time for the job would be two hours plus 15% for skill and plus 12% for effort, totalling two hours and thirty-two minutes; while another man takes three hours and fifteen minutes to do the same job and was rated E2 for skill, which is minus 10% and F1 for effort, which is minus 12%, thus returning the operation to the standard time of two hours and thirty-two minutes. Unfortunately in actual practice is does not work out quite so smoothly as this owing to human element in arriving at the ratings, however we have overcome this difficulty in the use of the second form that I have given you.

This is the sheet on which the time studies are tabulated and circulated to the foreman and any other interested persons or departments. We make as many studies of the same operation as are practical. The actual utilized man-hours are recorded under the heading 1st reading, second reading, etc. Then, the standard times are calculated for each reading, the results are added together and deducted from the total of the actual readings, the difference is expressed in a percentage of the total of the actual times and written in the column labelled "levelling factor". The average of the five standard times is then shown in the column at the extreme right of the page as the standard time for the operation. In this manner we overcame the variance in the personnel rating.

At the bottom of the page you will note a blank percentage allowance. We insert in here a figure to allow for reasonable and legitimate causes for lost man-hours, such as smoke periods, attendance at the wash-rooms, toolcribs, etc. The figure will vary in different shops and different

plants. The most common figure that we have used at Boeings has been around 7.5%.

We usually carry our service further by supplying the foreman with "achievement" cards. This is simply a recopy of the time study on a card showing all the sub-operations against which are placed their respective standard times. Columns are allotted for the name or clock number of the employee designated to do the operation, times at which the operations are started and finished, utilized man-hours and the achieved percentage of the standard. One of these cards, a sample of which is being passed around to you, is placed on each unit as work is started on it in the shop, and is maintained either by the employees themselves or by the junior supervisory staff. Calculating the utilized man-hours and the percentage achievement is done by a clerk in the foreman's office.

The foregoing will give you an approximate idea of how we have attempted to adapt the standardized procedures of Time and Motion Study to the assembly work of a specialized industry. You can see that if properly used the results of our work will facilitate that of other service departments, as well as increase the operating efficiency of the productive shops. Purchasing, processing and delivery schedules may be prepared far in advance and yet with an eye to great accuracy. Labour requirements and shop loading can be anticipated. Estimated costs can be established. More accurate utilization of machines, floor space and man-hours means better control of overhead.

A word about the men chosen to observe and apply time study. The common reaction in a plant is that we are stoolpigeons for management, and as such, persons to be carefully avoided and, if possible, fooled. Sometimes the foreman's feelings are antagonistic; he has run his shop his own way for quite a while, and, in his opinion, quite satisfactorily. Primarily therefore, the time study man must be a salesman, not so much a salesman of the service he is supplying, but a salesman of himself. Create in the minds of the supervisory staff of the shop that he is there to help them, that he is working for them, and that if the results of the work show in an increased efficiency curve in the operation of the shop the foreman and his workers will be the ones to receive the thanks of management. The observer must learn to be tactful and friendly with both the supervision and the employees without becoming familiar with either.

Finally I would like to mention the position of time study in the post-war era. In these times when there is a ready consumer waiting for the goods that we manufacture we are apt to lose sight of the controls that would govern us were we manufacturing for a highly competitive market. No doubt many of you have recently walked through the production lines in the plants that you represent and have noticed a condition not very easily detectable in cost reports. There is an outstanding decline in individual productivity. During war-time there are certain factors, such as independence and indifference brought about by high wages and easy to get jobs, that are creating and abetting this decline. To quote Mr. Herrgen, Manufacturing Methods Manager of R C A Victor: ". . . to combat this trend, to meet schedules and to maintain some reasonable control of cost, many plants are turning to the most versatile tool that management has—TIME STUDY. It is a safe estimate that the number of establishments

employing it has quadrupled since the war began . . ." If anything I would say that I think that he is underestimating the number. Countless job machine shops which possessed the necessary machinery to make large orders of parts for major contractors found themselves completely at sea when the contractors called for deliveries of large quantities and varieties of parts on a rigid schedule.

Labour unions, which once frowned on the practice of time study, are realizing that if jobs for all are to be found in the post-war period it will be necessary for management to have the tools with which to meet the competition of peace-time manufacturing—the greatest of these tools is time study.

TIME STUDY ANALYSIS

DATE	ASSEMBLY	OPERATION NO:	W/O NO:
SHOP NO:	MAJOR OPERATION DESCRIPTION	STATION NO:	SUB NO:

SUB-OP'N NO:	SUB-OPERATION DESCRIPTION	1st READING	2nd READING	3rd READING	4th READING	AVR. READ.	LEV FACTOR	ST D TIME
		Unit NO:s						
	TOTAL STUDIED TIME PER UNIT							
	TOTAL STUDIED TIME PER AIRCRAFT							

UNITS PER AIRCRAFT	OBSERVERS MAKING STUDIES	TOTAL STANDARD TIME	
OBSERVER'S REMARKS:-		PLUS ALLOWANCE %	
		TOTAL STANDARD TIME PER UNIT	
		TOTAL STANDARD TIME PER AIRCRAFT.	

OPERATIONAL TIME STUDY SHEET - BOEING AIRCRAFT OF CANADA LTD

PAGE NO. 1

DATE Sept 15/64	ASSEMBLY Outer Wing Panel	Unit No 300	QTY PER SHIP 1
SWOP NO. 339	MAJOR OP N DESCRIPTION First floor position	Station No 5	MAJOR OP N NO 5
OVERALL CLOCK: Start Date Sept 15/64 Time 8:00 A.M. P.M.	Stop Date Sept 15/64 Time 9:55 A.M. P.M.		OBSERVER PE

Op n No	SUB OPERATION DESCRIPTION	Employees Clock No	Rating S	E	Hr.		INDIVIDUAL TIME READING											Man-Hours Before Adjustment	Man-Hours Adjusted
5-a	Install landing lights	12340	E	12401		8:00	8:18	8:23	9:00	9:05	9:40	9:40	9:55						
			CONSISTENCY				8:18	8:23	9:00	9:05	9:30	9:40							
	" " "	23401	L	D		8:00	9:10	9:16	9:25	9:40	9:55								
			CONSISTENCY				9:15	9:16	9:30	9:40									
			CONSISTENCY																
5-b	"		CONSISTENCY																
5-c	"		CONSISTENCY																
			CONSISTENCY																
			CONSISTENCY																
			CONSISTENCY																
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			CONSISTENCY																
			CONSISTENCY																
			CONSISTENCY																

SAMPLE ONLY

P M 189

GROSS MAN-HOURS PER AIRCRAFT — ACTIVE / NON-ACTIVE

Examination Questions

ACCOUNTING II — MAY, 1944

Question 1. (10 marks).

Explain the "lower of cost or market" principle for the valuation of inventory of manufactured goods. Indicate the application of this rule in the following circumstances.

(a) An article costing $4 usually selling for $5 but not now likely to fetch more than $2.50.

(b) An article which had cost $5 to make and saleable at $6 but now capable of being produced for $4.

(c) An article costing $5 and saleable at $7.50 but not now capable of being produced under $6.25.

Question 2. (10 marks).

The profits, after income and excess profits tax provision, shown by the books of a certain company were as follows: 1939, $125,679.42; 1940, $247,869; 1941, $107,542.41; 1942, $314,274.64 (years ending December 31).

An investigation for purposes of a prospectus revealed errors in inventory valuation as follows:

Dec. 31, 1939—Inventory overstated by $12,000;
Dec. 31, 1940—Inventory understated by $2,500;
Dec. 31, 1941—Inventory overstated by $31,700;
Dec. 31, 1942—Inventory overstated by $20,000;

Income and excess profits taxes had in each year been estimated at 40 per cent. of the profit before taxes.

What were the correct figures of profit after taxes for each of the years in question?

Question 3. (15 marks).

The general ledger of the Cyclo Manufacturers Ltd. contained the following account:

Machinery and Equiment

1943		1943	
Jan. 1—Balance	$123,916.43	Mar. 31—Cash	$ 517.36
Mar. 31—V. R.	12,409.17	Dec. 31—Cash	500.00
May 31—V. R.	1,217.00	Dec. 31—Balance	138,588.16
Aug. 31—V. R.	427.92		
Nov. 15—V. R.	1,635.00		
	$139,605.52		$139,605.52
1944			
Jan. 1—Balance	$138,588.16		

A scrutiny of the transactions posted to the account during the year 1943 disclosed the following:

(a) On March 31 the company realized $517.36 on the sale for scrap of an old machine which had cost $7,500. The reserve for depreciation included credits applicable to this machine in the amount of $6,000, accumulated at the rate of $750 per year; the last entry therefor having been made at December 31, 1942.

(b) During March the company replaced the machine of (a) by a new machine, the invoice cost of which was $10,000. Freight on this machine was $897.37 and the labour cost of installing it was $318.25. In the course of setting it up it was discovered that the foundation of the mill was rotten in places and this had been remedied at a cost of $1,193.55.

(c) The debit of $1,217.00 represents the cost of changing the position of several machines with a view to increasing the operating efficiency of the mill. It is estimated that the original cost of installing these machines was $1,000.00.

(d) In August premiums on fire insurance covering the machinery were paid in the amount of $427.92.

(e) The $1,635.00 charged in November was the cost of extending the sprinkler system.

(f) On December 31 the company received $500.00 for the rental of a portable power saw which it had leased to a logging enterprise.

Assuming that the opening balance of the account is correct you are asked to submit any adjusting journal entries required to produce a correct balance on the account at January 1, 1944.

N.B.—Journal entries must be supported by full explanations.

Question 4. (15 marks).

The X Washing Machine Co Ltd. of Galt opened a retail store in Ottawa on May 31, 1943.

The head office supplies the branch with manufactured merchandise which it charges to the branch at selling price. It pays all major branch expenses itself but allows the branch to operate an imprest petty cash fund for $25.00 for the payment of small expenses. The branch does not operate a system of accounts but merely reports its transactions to head office daily. Cash receipts are deposited to the credit of head office.

From the information given below you are asked to write up in the head office general ledger the accounts relating to the branch from the date of its opening to December 31, 1943, to make adjusting and closing entries at the latter date and to write up the branch profit and loss account as it would appear in the general ledger.

Transactions from May 31, 1943, to December 31, 1943.

Retail value of merchandise shipped to the branch, $61,500 (cost $48,000).

Retail value of merchandise returned by branch as defective $3,200 (cost $2,500).

Branch cash sales, $53,800.

Remittances to branch in reimbursement of petty cash fund, $315.

Branch expenses paid by head office, $7,800.

Retail value of merchandise donated by branch, on instruction of head office, to promote sales, $500 (cost $400).

Supplementary information

Retail value of branch inventory at December 31, 1943, $4,000 (cost $3,000).

Petty cash on hand at branch December 31, 1943, $25.

The furniture and equipment of the Ottawa branch is carried in the head office general ledger at $3,600. It is to be depreciated at the rate of 16⅔ per cent. per annum.

Question 5. (15 marks).

The balance sheet of Paul Jones & Sons on March 31, 1944, was as follows:

Assets		Liabilities		
Cash on hand and in bank	$ 34,439	Accounts payable		$ 250,500
Other assets	751,500	Capital:		
		P. Jones	$ 401,387	
		A. Jones	80,920	
		B. Jones	53,132	
				535,439
	$ 785,939			$ 785,939

The partners share profits and losses in the ratio, P. Jones, 70 per cent.; A. Jones, 20 per cent.; B. Jones, 10 per cent.

On March 31, 1944, the partners decided to sell their business as a going concern to the Universal Company Limited on the following terms:

(1) The company to take over the whole of the assets except cash on hand and in bank.

(2) The company to assume the liability for the accounts payable.

(3) The purchase consideration to take the form of the payment of $400,000 in cash and the allotment to the partnership of 15,000 common shares N.P.V. in the Universal Company Limited. These shares have a market value of $10 each.

The partners agree that each of the cash and shares available for distribution on liquidation of the partnership shall be divided amongst them in proportion to their capitals as adjusted for any loss or gain on liquidation.

You are required to give journal entries recording the dissolution of the partnership.

Question 6. (35 marks).

From the following trial balance and supplementary information you are asked to prepare a manufacturing statement, an income statement and an earned surplus statement for the year ending March 31, 1944, and a balance sheet at that date.

THE TRENT MANUFACTURING CO. LTD.

Trial Balance, March 31, 1944 (Before Closing)

Bills receivable	$ 10,000	
Cash at bank	82,753	
Accounts receivable	431,000	
Reserve for bad debts		$ 8,460
Marketable securities (at cost)	97,487	
Inventories, April 1, 1943:		
Finished goods	62,000	
Work in process	28,000	
Raw materials	118,000	
Factory supplies	3,600	
Tools	18,970	
Bond discount	250	
Prepaid insurance, April 1, 1943	1,260	

Land	16,000	
Factory Buildings	240,000	
Reserve for depreciation of factory buildings		80,000
Machinery	872,000	
Reserve for depreciation of machinery		412,000
Office furniture and equipment	6,800	
Reserve for Depreciation of office furniture and equipment		3,000
Patents	41,460	
Bills payable		25,000
Accounts payable		116,000
5% Mortgage bonds payable		100,000
Share capital (paid up)		445,000
Earned surplus		433,868
Distributable surplus		100,000
Sales		1,465,000
Sales returns and allowances	16,420	
Raw material purchases	481,000	
Freight-in on raw materials	92.100	
Purchase returns and allowances		8,920
Direct labour	217,500	
Indirect labour	28,560	
Heat, light and power	58,080	
Repairs—Buildings	1,800	
—Machinery and equipment	2,940	
Factory supplies purchases	10,610	
Fire Insurance—Buildings and machinery	1,800	
—Raw materials and work in process	480	
—Finished goods	308	
Compensation insurance	2,500	
Unemployment insurance	1,800	
Municipal taxes	7,900	
Tools expenses	10,750	
Factory superintendence	5,000	
Packing and shipping	9,200	
Sales, salaries and commissions	82,000	
Salesmen's travelling expenses	21,200	
Advertising	50,000	
Freight out	5,600	
Officers' salaries	20,000	
Office salaries	12,600	
Stationery and printing	4,700	
Postage, telephone and telegraph	3,800	
Miscellaneous administrative expense	500	
Interest earned		2,620
Interest expense	4,750	
Sales discounts	21,200	
Purchase discounts		4,810
	$ 3,204,678	$ 3,204,678

Supplementary Information:

(1) The authorized share capital consists of 100,000 shares of no par value. Of these 73,000 have been issued and fully paid.

(2) Inventories at March 31, 1944:

Finished goods	$ 78,000
Work in process	23,000
Raw materials	131,000
Factory supplies	4,700
Tools	17,840

(3) Depreciation (annual rates):
Factory buildings—3%.
Machinery—12%.
Office furniture and equipment—15%.

(4) Patent amortization. Ten per cent. of book balance.

(5) Prepaid insurance:

	April 1, 1943	Mar. 31, 1944
Fire insurance—Buildings and machinery	$ 900	$ 750
—Raw materials and work in process	75	100
—Finished goods	40	50
Compensation insurance	245	150
	$ 1,260	$ 1,050

(6) Reserve for bad debts to be adjusted to equal two and one half per cent. of the accounts receivable.

(7) Accrued wages at March 31, 1944:

Direct labour	$725
Indirect labour	190
	$915

(8) On April 10, 1944, a dividend of $1.00 per share was declared payable May 1 to shareholders of record March 31.

(9) The bonds payable had been issued on April 1, 1929, as 15 year bonds. The issue price was $92.50. Bond interest has been paid and charged up to September 30, 1943.

(10) The market value of the marketable securities was $101,205.00 on March 31, 1944.

(11) Provide for income and excess profits tax in the amount of $84,000.

Chapter Notes

Toronto

The October meeting of the Toronto Chapter was one of the most successful of the past few years. The meeting was in the form of a Students Night, and was run entirely by the Students' Section under the capable Chairmanship of Mr. W. Earle.

The speaker was Mr. L. A. Murphy of the Massey-Harris Co. Ltd., and his subject was "The Preparation of a War Contract Cancellation Claim."

Mr. Earle, Chairman of the Student Section, and his Executive are to be complimented on the excellent handling and organization of this meeting.

The next meeting is to be held at Malloney's Art Gallery on November 15th, 1944, and is the regular Joint Meeting with the Hamilton Chapter.

Fort William-Port Arthur.

The opening meeting of the Chapter was held on September 19, 1944. The speaker was Mr. A. H. Britton, Field Representative for the Dominion Provincial Vocational Plan, and his subject was "The Rehabilitation Program as outlined by the Government".

The October meeting was held in the Prince Arthur Hotel, Port Arthur, on Thursday, October 19, 1944. The speaker was Mr. E. G. Charnock, Chairman of the Transportation Committee, Fort William Chamber of Commerce. This talk was "How Come and So What of Freight Rates".

Kitchener

The October meeting of the Chapter was held on Tuesday, October 17th, 1944, at the Canadian General Rubber Co. Ltd., Galt, Ont.

The speaker was our Ontario President, Mr. H. M. Hetherington, R.I.A., and his subject was "Cost Accountants and Credit Managers in Partnership."

Hamilton

The October meeting of the Hamilton Chapter was held on Tuesday, October 10th, 1944, at the Royal Connaught Hotel. This meeting took the form of a Joint Meeting with The National Office Management Association.

A panel discussion took place and the subject was "Critical Labor Area Problems as Affecting Office Managers".

COST STUDIES PUBLISHED BY THE SOCIETY

(Copies available at 50 cents each).

Accounting in the Public Interest	April, 1944
Accounting System, Planning a Factory	Oct., 1942
After Victory—What?	Dec., 1942
Aviation in Canada—History and Development of	Feb., 1942
Aircraft Production—Cost Determination In	Mar., 1944
Bonus Methods	May, 1933
British Empire Content Certificate Preparation of	May, 1939
Budgetary Control as an Aid to Business Profit	Dec., 1939
Budgetary Control, Cost Accounting and	July, 1934
Budgetary Control	July, 1934
Budgetary Control	Oct., 1942
Budgetary Controls That Control	April, 1940
Business, Control of, Through Budget	Sept., 1938
Business Organization	July, 1937
Canadian Government Work Production Contracts	May, 1943
Cancellation Procedure in an Electrical Products Mfg. Co.	Sept., 1944
Canning—Food Accounting for Raw Materials in	Feb., 1943
Canning Industry—Costs in—With Special Reference to Tomato Producers	Oct., 1943
Catering Business—Costing for a	June-July, 1943
Clear Thinking in Management	June-July, 1942
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